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A Level Physical Education

H555/01 Physiological factors affecting performance

Sample Question Paper Version 2.2

Date – Morning/Afternoon

Time allowed: 2 hours

You must have:
- the Question Paper

You may use:
- a calculator

First name									
Last name									
Centre number						**Candidate number**				

INSTRUCTIONS
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

INFORMATION
- The total mark for this paper is **90**.
- The marks for each question are shown in brackets **[ ]**.
- Quality of extended response will be assessed in the question marked with an asterisk (*).
- This document consists of **16** pages.

Section A
Answer all the questions.

1 Name **one** agonist and **one** antagonist at the ankle joint at the point of take-off during a vertical jump.

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[2]

2 Identify the processes that occur during the fast component of excess post exercise oxygen consumption (EPOC).

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[2]

3 Define linear motion and explain how linear motion is created.

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4 Identify **two** factors that affect the horizontal distance travelled by a projectile.

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5 Describe a suitable method of evaluating the aerobic capacity of an unfit, overweight 50 year old.

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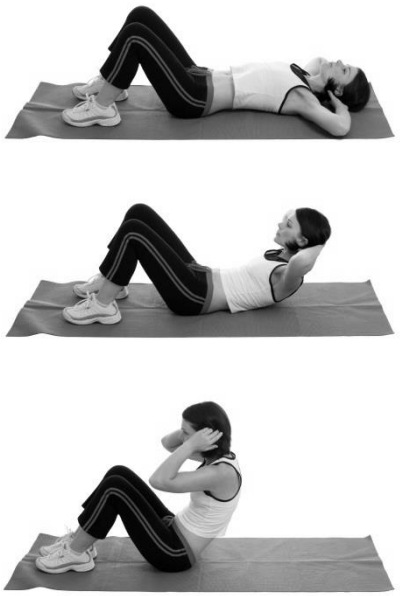
[2]

Section B
Answer all the questions.

6 **Fig.1** shows a performer doing a sit up.

Fig.1



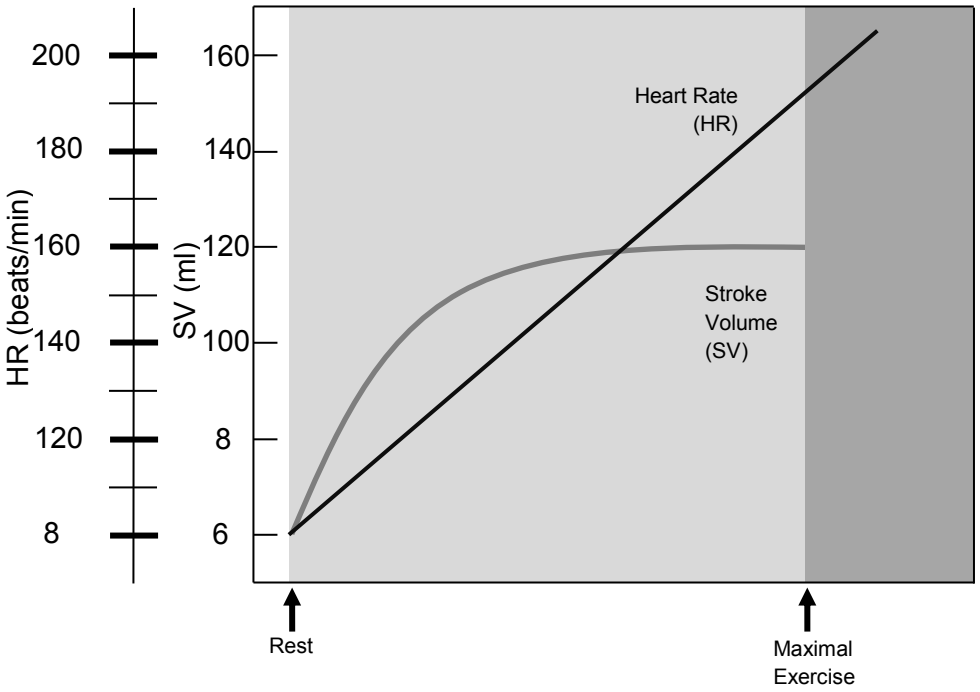
(a) Complete the table below to show the movements that take place at the hip joint during both the upward and downward phases.

Phase	Agonist	Movement produced	Type of contraction
Upward			
Downward			

[6]

(b) **Fig.2** shows the changes in stroke volume and heart rate from rest to maximal exercise.

Fig.2



(i) Calculate the cardiac output when the heart rate is 180bpm. Show your working.

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(ii) Explain the changes to stroke volume during sub maximal exercise.

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(c) Explain what is meant by the term 'cardiovascular drift'.

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[4]

(d) Two netballers were arguing about the positioning of netball on the energy continuum.

Discuss the suggestion from their teacher that there are many factors to consider and that they may both be correct.

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[5]

7 **Table 1** shows the time in seconds that a 100m sprinter covered each 10 metre section of a race.

Table 1

Distance (m)	Time taken (s)
0–10m	1.86
10–20m	1.03
20–30m	0.92
30–40m	0.88
40–50m	0.88
50–60m	0.83
60–70m	0.83
70–80m	0.86
80–90m	0.85
90–100m	0.85
Total time	9.79 seconds

(a) Using the data in the table, calculate the following to two decimal places, showing your working:

(i) Average velocity between 0–10m.

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[2]

(ii) Average acceleration between 0–10m.

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[2]

(iii) Average velocity during the race.

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[1]

(b) Define 'centre of mass'. Explain how a rugby player can apply knowledge of centre of mass to increase their stability.

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[4]

(c) **Fig.3** shows a gymnast performing a back somersault.

Fig.3

Explain how angular velocity is controlled by the gymnast during take-off, flight and landing.

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[6]

(d) A footballer taking a free kick may apply sidespin to the ball to make it swerve.

Draw and label an airflow diagram of the ball in flight. Explain how spin causes the flight path of the ball to deviate.

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[5]

8 **Table 2** shows the weekly breakdown of a hockey player's diet.

Table 2

Component of diet	Weekly intake
Carbohydrates	50%
Fats	40%
Proteins	10%
Vitamins and minerals	Well below recommended guidelines
Fruit and vegetables	Below recommended guidelines

(a) Evaluate the potential impact of this diet on the player's health and physical performance. Recommend changes that should be made to the intake of carbohydrates, fats and proteins.

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(b) Compare erythropoietin (EPO) and human growth hormone (HGH) as ergogenic aids to performance.

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(c) **(i)** Describe **three** physiological benefits of a warm up.

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(ii) Plan an effective warm up, which includes dynamic stretching, for a performer in a named activity.

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[3]

(d) Complete the table below explaining the SALTAPS assessment routine for a suspected sprain, suffered during a sporting activity.

See	See what happened
Ask	Ask what happened/where it hurts
Look	Look for swelling or deformity
Touch	
Active	
Passive	
Strength	

[4]

Section C

9* An elite marathon runner will have a very high aerobic capacity.

Explain how the aerobic system provides energy during a marathon and how cardiovascular adaptations as a result of an aerobic training programme can enhance aerobic capacity.

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[20]

Additional Answer space

If you require additional space to complete an answer please use this page. The question number(s) must be clearly shown.

Summary of updates

Date	Version	Details
September 2021	2.2	Updated copyright acknowledgements.